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09/903,783	07/11/2001	Shunpei Yamazaki	07977/281001/US5070/5076	1495

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EXAMINER

STULTZ, JESSICA T

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 05/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/903,783

Applicant(s)

YAMAZAKI ET AL.

Examiner

Jessica T Stultz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☒ Claim(s) 32-39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Specification***

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Drawings***

Figures 20A, 20B, 21, and 23 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 1-5 and 32-35 (and therefore dependent claims 6-31 and 36-39) are objected to because of the following informalities: "and an SRAM" should be changed to "and a SRAM". Claim 5 is objected to because of the following informalities: "and an SRAM for: imparting" should be "and a SRAM for imparting". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 1-9 and 18-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura.

Regarding claims 1-2, Nakamura discloses a digital micromirror device (Column 3, lines 37-45, wherein the DMD is "10", Figures 1, 2, and 3A-C) comprising: a first electrode and a second electrode (Column 3, lines 46-54, wherein the first and second electrodes are "15 and 16", Figures 2 and 3A-C) for changing the inclination of the micromirror (Column 3, line 55-Column 4, line 3, wherein the micromirror "12" is tilted by electrodes "15 and 16", Figures 2 and 3A-C); a micromirror located over the first electrode and second electrode (Column 3, lines 37-54, wherein the micromirror is "12", Figures 1, 2, and 3A-C); a first switching element; a second switching element (Column 3, line 55, Column 4, line 3, wherein the switching elements are the transistors in memory cell "14a", Figures 3A-C); and a SRAM (Column 3, lines 41-57, wherein the SRAM is "14", Figures 2 and 3A-C); wherein an output of the first switching element is connected to the first electrode (Column 3, lines 57-62, wherein one transistor is connected to electrode "15", Figures 2 and 3A-C); an output of the second switching element is connected to the second electrode (Column 3, lines 57-62, wherein one transistor is connected to electrode "16", Figures 2 and 3A-C); an input of the SRAM is connected to the first electrode; an output of the SRAM is connected to the second electrode (Column 3, line 55-Column 4, line 27, wherein the electrode "15" is charged with a positive voltage and "16" is charged with a negative voltage, Figures 2 and 3A-C); and the voltages of the input and output of the SRAM mutually differ (Column 3, line 33-Column 4, line 3, wherein the SRAM "14" causes a bias voltage to the electrodes and therefore the input/output voltages differ, Figures 2 and 3A-C).

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Regarding claim 3-5, Nakamura discloses a digital micromirror device (Column 3, lines 37-45, wherein the DMD is "10", Figures 1, 2, and 3A-C) comprising: a micromirror (Column 3, lines 37-54, wherein the micromirror is "12", Figures 1, 2, and 3A-C); a first electrode and a second electrode (Column 3, lines 46-54, wherein the first and second electrodes are "15 and 16", Figures 2 and 3A-C) for changing the inclination of a micromirror (Column 3, line 55-Column 4, line 3, wherein the micromirror "12" is tilted by electrodes "15 and 16", Figures 2 and 3A-C); a first switching element for imparting a first voltage or a second voltage to the first electrode (Column 3, line 55-Column 4, line 27, wherein the charge on the electrode "15" varies between positive and negative depending on the mirror drive data, Figures 2 and 3A-C); a second switching element for imparting the first voltage or second voltage of the second electrode (Column 3, line 55-Column 4, line 27, wherein the charge on the electrode "16" varies between positive and negative depending on the mirror drive data, Figures 2 and 3A-C and Column 3, line 55, Column 4, line 3, wherein the switching elements are the transistors in memory cell "14a", Figures 3A-C); and a SRAM (Column 3, lines 41-57, wherein the SRAM is "14", Figures 2 and 3A-C); wherein a second voltage is imparted to the second electrode by the SRAM when a first voltage is imparted to the first electrode by the first switching element (Column 3, line 55-Column 4, line 27, wherein the charge on the electrode "16" varies between positive and negative depending on the mirror drive data, Figures 2 and 3A-C); said first voltage is imparted to the second electrode by the SRAM when the second voltage is imparted to the first electrode by the first switching element (Column 3, line 55-Column 4, line 27, wherein the charge on the electrode "15" varies between positive and negative depending on the mirror drive data, Figures 2 and 3A-C); the first voltage is imparted to the first electrode by the SRAM when

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the second voltage is imparted to the second electrode by the second switching element (Column 3, lines 57-62, wherein the switching elements are the transistors connected to electrodes "15 and 16", Figures 2 and 3A-C); a switching of the first switching element is controlled by a first signal; and a switching of the second switching element is controlled by a second signal (Column 3, line 55-Column 4, line 27, wherein the transistors are controlled by a signal from the mirror drive data from memory cell "14a").

Regarding claims 6-9, it is inherent from Nakamura that the digital micromirror device as disclosed above further include the SRAM comprising two p-channel transistors and two n-channel transistors, this being reasonably based upon there being "at least two transistors" in the memory cell "14a" and the transistors being disclosed as yielding positive and negative voltages and due to the similarity in structure between Nakamura and the claimed invention (Column 3, line 55-Column 4, line 27, Figures 2 and 3A-C).

Regarding claims 18-31, Nakamura discloses a digital micromirror device as disclosed above and further discloses this device by placed in an electronic device, specifically a printer (Column 4, lines 55-57, wherein the DMD "10" is shown in a digital color printer, Figure 4).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura in view of Maimon et al.

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Regarding claims 10-17, Nakamura discloses a digital micromirror device as disclosed above in claims 2-5, wherein the SRAM comprises two p-channel and two n-channel transistors, but does not specifically disclose that the SRAM further comprise two resistors. Maimon et al teaches of a SRAM having four transistors and two resistors (Column 5, lines 7-32, wherein the SRAM is "70", the resistors are "84a and 84b" and the transistors are "74a, 74b, 76a, and 76b", Figure 9), wherein the resistors reduce the chances that radiation or other disturbances will cause perturbations (Column 5, lines 25-30). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made for the SRAM in the digital micromirror device of Nakamura to further include two resistors since Maimon et al teaches of a SRAM having four transistors and two resistors, wherein the resistors reduce the chances that radiation or other disturbances will cause perturbations.

***Allowable Subject Matter***

Claims 32-39 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103.

Specifically regarding independent claims 32-35, none of the prior art alone or in combination disclose or teach of a method of driving a digital micromirror device having a plurality of pixels specifically wherein a ratio of the lengths of the display periods "n" is expressed as  $2^0: 2^1: \dots : 2^{(n-1)}$ .

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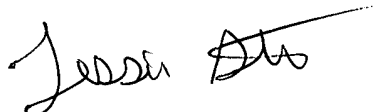
***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Millward et al and Bhuvra read on or make obvious the above rejected claims, however, these rejections would have been repetitious.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T Stultz whose telephone number is (703) 305-6106. The examiner can normally be reached on M-Th 7:30-5, and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 703-308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Jessica Stultz  
May 8, 2003



Georgia Epps  
Supervisory Patent Examiner  
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